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L2: Entry 1 of 2

File: JPAB

Apr 9, 2002

PUB-N0: JP02002103919A

DOCUMENT-IDENTIFIER: JP 2002103919 A

TITLE: PNEUMATIC TIRE

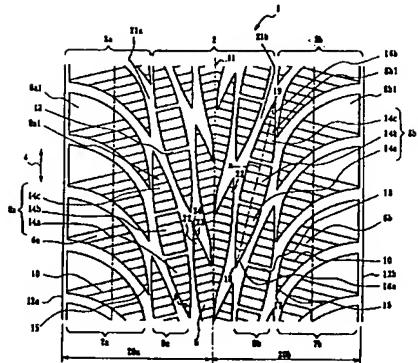
PUBN-DATE: April 9, 2002

INVENTOR-INFORMATION:

NAME

OCHI, NAOYA

COUNTRY



ASSIGNEE-INFORMATION:

NAME

BRIDGESTONE CORP

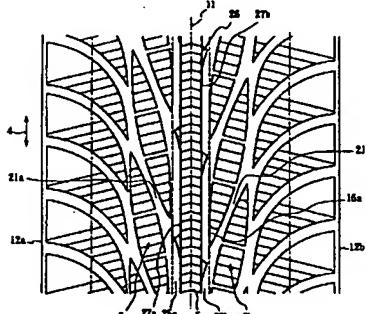
COUNTRY

APPL-NO: JP2000303117

APPL-DATE: October 3, 2000

INT-CL (IPC): B60 C 11/11; B60 C 11/04; B60 C 11/12

ABSTRACT:



PROBLEM TO BE SOLVED: To provide a pneumatic tire satisfying the driving/braking performance on an ice/snow road surface and the draining performance on a wet road surface at good balance.

SOLUTION: A tread section 1 is provided with a rib-like land section 5, intermediate land columns 9a and 9b comprising groups of second block land sections 8a and 8b, and side land section columns 7a and 7b comprising groups of first block land sections 6a and 6b. A pair of first block land sections 6a1 and 6b1 and a pair of second block land sections 8a1 and 8b1 are arranged into an inverse truncated chevron shape toward tread ends 12a and 12b side from a pattern center 11 side. The second block land sections 8a and 8b comprises a plurality of split land sections 14a-14c having a nearly convex lens cross sectional tread shape and divided by fine grooves 13. Chamfering sections are provided on the corner sections 15 of the first block land sections 6a and 6b and both corner sections 16a and 16b of the second block land sections 8a and 8b. A plurality of sipes 10 crossing the land sections 5, 6a, 6b, 8a, 8b are arranged on them.

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L2: Entry 2 of 2

File: DWPI

Apr 9, 2002

DERWENT-ACC-NO: 2002-551670

DERWENT-WEEK: 200279

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TITLE: Pneumatic tire for snowy road surface has multiple sipes formed across convex ribs and side and intermediate convex blocks

PATENT-ASSIGNEE:

ASSIGNEE	CODE
BRIDGESTONE CORP	BRID

PRIORITY-DATA: 2000JP-0303117 (October 3, 2000)

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PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> JP 2002103919 A	April 9, 2002		007	B60C011/11

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP2002103919A	October 3, 2000	2000JP-0303117	

INT-CL (IPC): [B60 C 11/04](#); [B60 C 11/11](#); [B60 C 11/12](#)

ABSTRACTED-PUB-NO: JP2002103919A

BASIC-ABSTRACT:

NOVELTY - Intermediate convex blocks (8a,8b) of convex lens shape, consists of several convex portions (14a-14c) separated by fine groove (13). A chamber whose width of convex portion reduces at an angular portion (15,16a,16b) of side convex blocks (6a,6b,8a,8b), is positioned towards a pattern center side (11). Multiple sipes (10) are formed across convex ribs (5), side and intermediate convex blocks.

USE - For snowy road surface.

ADVANTAGE - Excels in braking effect on both sides on ice and snowy road surface.
Obtains draining effect on wet surfaces.

DESCRIPTION OF DRAWING(S) - The figure shows the tread portion of the pneumatic tire.

Convex ribs 5

Convex blocks 6a,6b,8a,8b

Sipes 10

Pattern center side 11

Fine groove 13

Convex portions 14a-14c

Angular portions 15,16a,16b

CHOSEN-DRAWING: Dwg.1/3

TITLE-TERMS: PNEUMATIC ROAD SURFACE MULTIPLE FORMING CONVEX RIB SIDE INTERMEDIATE CONVEX BLOCK

DERWENT-CLASS: A95 Q11

CPI-CODES: A11-B17; A12-T01B;

ENHANCED-POLYMER-INDEXING:

Polymer Index [1.1] 018 ; H0124*R ; S9999 S1434 Polymer Index [1.2] 018 ; ND01 ; Q9999 Q9234 Q9212 ; Q9999 Q9256*R Q9212 ; K9416 ; B9999 B5367 B5276

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C2002-156521

Non-CPI Secondary Accession Numbers: N2002-436936

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【特許請求の範囲】

【請求項1】 トレッド部を中央域と両側方域に区分するとき、前記中央域に位置しタイヤ周方向に沿って連続して延びる少なくとも1本のリブ状陸部と、前記側方域に位置しタイヤ周方向に所定の間隔で配設した複数個の第1ブロック陸部からなる側方陸部列と、リブ状陸部と側方陸部列との間に位置しタイヤ周方向に所定の間隔で配設した複数個の第2ブロック陸部からなる中間陸部列とをトレッド部に有する空気入りタイヤにおいて、

パターンセンターを挟んで向かい合う、一対の第1ブロック陸部同士及び一対の第2ブロック陸部同士は、いずれもパターンセンター側からトレッド端側に向かって逆ハの字状の配置関係にあり、

前記中間陸部列を構成する第2ブロック陸部は、タイヤの正面視で、略凸レンズ断面状の踏面形状を有し、かつ、その長手方向を横切る細溝の配設によって区分された複数個の分割陸部で構成され、

第1ブロック陸部の最もパターンセンター側に位置する角部及び第2ブロック陸部の両角部に、それぞれの先端に向かって陸部高さが減少する面取りを施し、

リブ状陸部、第1ブロック陸部及び第2ブロック陸部の各陸部に、これを横切る複数本のサイフを配設することを特徴とする空気入りタイヤ。

【請求項2】 タイヤの負荷転動時に、第2ブロック陸部は、そのパターンセンター側に位置する角部からトレッド端側に位置する角部に向かって順次接地する請求項1に記載した空気入りタイヤ。

【請求項3】 第2ブロック陸部は、その両角部の先端を結んだ直線(m)のタイヤ周方向に対する角度が、鋭角側から測定して5~55°の範囲にある請求項1又は2に記載した空気入りタイヤ。

【請求項4】 第2ブロック陸部は3個の分割陸部で構成する請求項1、2又は3に記載した空気入りタイヤ。

【請求項5】 第1ブロック陸部の最もパターンセンター側に位置する角部及び第2ブロック陸部の両角部は、その頂角が20~50°の範囲にある請求項1~4のいずれか1項に記載した空気入りタイヤ。

【請求項6】 第1ブロック陸部、及び第2ブロック陸部の分割陸部に配設するサイフの本数はそれぞれ少なくとも2本である請求項1~5のいずれか1項に記載した空気入りタイヤ。

【請求項7】 リブ状陸部、第1ブロック陸部及び第2ブロック陸部の各陸部におけるサイフの配設角度は、いずれもタイヤ周方向に対して比較的大きな角度とする請求項1~6のいずれか1項に記載した空気入りタイヤ。

【請求項8】 パターンセンターを挟んで向かい合う、一対の第1ブロック陸部同士及び一対の第2ブロック陸部同士は、いずれもタイヤ周方向に所定の位相差で形成してなる請求項1~7のいずれか1項に記載した空気入りタイヤ。

【請求項9】 リブ状陸部は、その両側壁から所定ピッチで交互に分岐する分岐部を有し、該分岐部は、第2ブロック陸部のパターンセンター側に位置する角部と向かい合う鋭角の角部を有し、該角部に、その先端に向かって陸部高さが減少する面取りを施す請求項1~8のいずれか1項に記載した空気入りタイヤ。

【請求項10】 リブ状陸部は、タイヤ周方向にストレート状に延びる1対の周方向溝によって区画形成され、該周方向溝は、第2ブロック陸部のパターンセンター側に位置する角部と対応する溝壁位置に、タイヤ周方向に隣接する2個の第2ブロック陸部間に位置する傾斜溝への水の流入を促進する擬似陸部を設ける請求項1~8のいずれか1項に記載した空気入りタイヤ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】この発明は、空気入りタイヤ、特に冬用空気入りタイヤに関するものであり、より詳細には、かかるタイヤの冰雪路面上での駆動・制動性能を確保しつつ、濡れた路面上での排水性能の向上を図る。

【0002】

【従来の技術】例えば、冰雪路面上を走行するのに適した従来の冬用空気入りタイヤ、いわゆるスノータイヤは、そのトレッドパターンとしては、図3に示すように、周方向に沿って延びるジグザグ溝及びストレート溝と、これらの溝間にわたってタイヤ幅方向に延びる横溝とを配設することによって、トレッド部に複数個の多角形のブロック陸部を区画形成するとともに、トレッド部をパターンセンターで2つのトレッド半区域に区分した

30 ときの左右トレッド半区域に位置するブロック陸部は、パターンセンターを挟んで線対称、又はタイヤ周方向に所定の位相差で左右トレッド半区域に位置するブロック陸部をずらしたような、いわゆる方向性パターンを形成するものではなく、一方のトレッド半区域に位置するブロック陸部と、他方のトレッド半区域に位置するブロック陸部との延在方向がタイヤ周方向の正逆を反転させた方向になるように180°回転させた、いわゆる点対称パターンとして配設されるのが一般的である。

【0003】上記のトレッドパターンを有するタイヤの場合、ストレート溝の配設は、濡れた路面上での排水性能を向上させるには有効であるが、特に冰雪路面上での駆動・制動性能の向上効果が小さく、一方、横溝は、冰雪路面上での駆動・制動性能は得られるものの、濡れた路面上での排水性能、特にハイドロプレーニング現象の発生を抑制する効果が小さい。

【0004】また、ジグザグ溝の配設は、冰雪路面上での駆動・制動性能向上させるには有効であるが、排水性能に劣るという欠点がある。

【0005】よって、従来のトレッドレッドパターンを有する冬用空気入りタイヤでは、冰雪路面上での駆動・

制動性能と濡れた路面上での排水性能の双方をバランスよく満足させることができ難しかった。

【0006】

【発明が解決しようとする課題】この発明の目的は、トレッド部の中央域にタイヤ周方向に沿って連続して延びるリブ状陸部を配設し、このリブ状陸部の両側に位置する中間陸部列及び側方陸部列のブロック陸部の形状を適正化して、濡れた路面での排水性能に有利な方向性パターンを形成するように設定するとともに、各陸部を横切るサイフを適正に配設することによって、冰雪路面上での駆動・制動性能と濡れた路面上での排水性能の双方をバランスよく満足した空気入りタイヤを提供することにある。

【0007】

【課題を解決するための手段】上記目的を達成するため、この発明は、トレッド部を中央域と両側域に区分するとき、前記中央域に位置しタイヤ周方向に沿って連続して延びる少なくとも1本のリブ状陸部と、前記側方域に位置しタイヤ周方向に所定の間隔で配設した複数個の第1ブロック陸部からなる側方陸部列と、リブ状陸部と側方陸部列との間に位置しタイヤ周方向に所定の間隔で配設した複数個の第2ブロック陸部からなる中間陸部列とをトレッド部に有する空気入りタイヤにおいて、パターンセンターを挟んで向かい合う、一対の第1ブロック陸部同士及び一対の第2ブロック陸部同士は、いずれもパターンセンター側からトレッド端側に向かって逆ハの字状の配置関係にあり、前記中間陸部列を構成する第2ブロック陸部は、タイヤの正面視で、略凸レンズ断面状の踏面形状を有し、かつ、その長手方向を横切る細溝の配設によって区分された複数個の分割陸部で構成され、第1ブロック陸部の最もパターンセンター側に位置する角部及び第2ブロック陸部の両角部に、それぞれの先端に向かって陸部高さが減少する面取りを施し、リブ状陸部、第1ブロック陸部及び第2ブロック陸部の各陸部に、これを横切る複数本のサイフを配設することを特徴とする空気入りタイヤである。

【0008】また、上記タイヤは、タイヤの負荷転動時に、第2ブロック陸部は、そのパターンセンター側に位置する角部からトレッド端側に位置する角部に向かって順次接地する向きに車両に装着することができる、排水性能を得る点から好ましい。

【0009】さらに、ブロックエッジの確保と排水性能向上効果の双方をバランスよく満足させる場合には、第2ブロック陸部は、その両角部の先端を結んだ直線mのタイヤ周方向に対する角度が、銳角側から測定して5°～55°の範囲にあることが好ましい。

【0010】さらにまた、雪上性能をより高める必要がある場合には、第2ブロック陸部は、3個の分割陸部で構成することが好ましい。

【0011】加えて、第1ブロック陸部の剛性を確保し

つつ、排水性を有利に向上させる場合には、第1ブロック陸部の最もパターンセンター側に位置する角部及び第2ブロック陸部の両角部は、その頂角が20～50°の範囲にあることが好ましい。

【0012】また、ブロック剛性をさほど低下させることなく雪上性能を効果的に増加させるには、第1ブロック陸部、及び第2ブロック陸部の分割陸部に配設するサイフの本数はそれ少なくとも2本であることが好ましい。

10 【0013】加えて、駆動・制動性能時の操縦性能をより一層向上させる場合には、リブ状陸部、第1ブロック陸部及び第2ブロック陸部の各陸部におけるサイフの配設角度は、いずれもタイヤ周方向に対して比較的大きな角度であることがより好適である。

【0014】さらに、パターンノイズの低減を図る必要がある場合には、パターンセンターを挟んで向かい合う、一対の第1ブロック陸部同士及び一対の第2ブロック陸部同士は、いずれもタイヤ周方向に所定の位相差で形成してなることが好ましい。

20 【0015】さらにまた、トレッド接地中央域の排水性能を高めるとともに、雪上性能に有効なエッジ成分を有効に増加させる手段としては、リブ状陸部は、その両側壁から所定ピッチで交互に分岐する分岐部を具え、該分岐部は、第2ブロック陸部のパターンセンター側に位置する角部と向かい合う銳角の角部を有し、該角部に、その先端に向かって陸部高さが減少する面取りを施すことが好ましい。

【0016】加えて、特に排水性能を重視する場合には、リブ状陸部は、タイヤ周方向にストレート状に延びる1対の周方向溝によって区画形成され、該周方向溝は、第2ブロック陸部のパターンセンター側に位置する角部と対応する溝壁位置に、タイヤ周方向に隣接する2個の第2ブロック陸部間に位置する傾斜溝への水の流入を促進する擬似陸部を設けることが好ましい。

【0017】

【発明の実施の形態】図1は、この発明に従う空気入りタイヤの代表的なトレッド部に形成したトレッドパターンの一部を示したものである。

【0018】図1に示すトレッド部1を有するタイヤは、トレッド部1を中央域2と両側域3a, 3bに区分するとき、前記中央域2に位置しタイヤ周方向4に沿って連続して延びる少なくとも1本のリブ状陸部5と、前記側域3a, 3bに位置しタイヤ周方向4に所定の間隔で配設した複数個の第1ブロック陸部6a, 6bからなる側方陸部列7a, 7bと、リブ状陸部5と側方陸部列7a, 7bとの間に位置しタイヤ周方向4に所定の間隔で配設した複数個の第2ブロック陸部8a, 8bからなる中間陸部列9a, 9bとを有している。

【0019】そして、この発明の構成上の主な特徴は、トレッド部1の中央域2にリブ状陸部5を配設するとと

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もに、リブ状陸部5の両側に位置する中間陸部列9a,9b及び側方陸部列7a,7bのそれぞれのブロック陸部8a,8b及び6a,6bの形状を適正化して、濡れた路面での排水性能に有利な方向性パターンを形成し、加えて、各陸部5,6a,6b,8a,8bを横切るサイフ10を適正に配設することにある。

【0020】より具体的には、前記中央域2にタイヤ周方向に沿って連続して延びる少なくとも1本のリブ状陸部5を配設し、パターンセンター11を挟んで向かい合う、一対の第1ブロック陸部6a1,6b1同士及び一対の第2ブロック陸部8a1,8b1同士を、いずれもパターンセンター11側からトレッド端12a,12b側に向かって逆八の字状に配置し、第2ブロック陸部8a,8bは、タイヤの正面視で、略凸レンズ断面状の踏面形状を有し、かつその長手方向を横切る細溝13の配設によって区分された複数個の分割陸部14a～14cで構成され、第1ブロック陸部6a,6bの最もパターンセンター11側に位置する角部15及び第2ブロック陸部の両角部16a,16bに、それぞれの先端17,18,19に向かって陸部高さが減少する面取りを施し、リブ状陸部5、第1ブロック陸部6a,6b及び第2ブロック陸部8a,8bの各陸部に、これを横切る複数本のサイブ10を配設することにあり、上記構成を採用することにより、氷雪路面上での駆動・制動性能と濡れた路面上での排水性能の双方をバランスよく満足させることができる。

【0021】尚、図1では、パターンセンター11はタイヤ赤道位置と一致している場合を示しているが、パターンセンター11がタイヤ赤道位置から幾分シフトしていてもよい。

【0022】以下、この発明を完成させるに至った経緯を作用とともに説明する。発明者は、冰雪路面上での駆動・制動性能と濡れた路面上での排水性能の双方をバランスよく満足させるため、トレッドパターンを、従来の点対称パターンではなく、排水性能の点で有利な方向性パターン、すなわち、パターンセンター11を挟んで向かい合う、一対の第1ブロック陸部6a1,6b1同士及び一対の第2ブロック陸部8a1,8b1同士を、いずれもパターンセンター11側からトレッド端12a12b側に向かって逆ハの字状に配置した方向性パターンを採用することとした。

【0023】そして、発明者はまず、前記中央域2に位置するタイヤ周方向4に沿って連結して伸びる少なくとも1本のリブ状陸部5を配設すれば、トレッド部1の中央域2に位置する陸部の接地面積が増加し、乾いた路面や、氷雪路面のような低摩擦路面を走行したときのグリップ力を確保することができる。

ド接地域に存在する水を、左右のトレッド半区域20a, 20bに実質的に分断できるため、上述したような水の混流を防止することができ、また、トレッド接地中央域に存在する水をスムーズに分流することができ、この結果、排水性能が高まる。

【0025】さらに、リブ状陸部5の両側に、それぞれ複数個の第2ブロック陸部8a, 8bからなる中間陸部列9a, 9bと、複数個の第1ブロック陸部6a, 6bからなる側方陸部列7a, 7bとを設けて、ブロック基調とすることによつて、基本的な雪上性能を確保することができる。

【0026】さらにまた、第2ブロック陸部8a,8bの踏

【0026】さらにまた、第2ブロック陸部8a, 8bの踏面形状を、図1に示すように略凸レンズ断面状、より具体的に言えば、2つの円弧の一部を重なり合わせたときの重なり合った領域の輪郭形状のように流線形の形状にすることによって、水流に対するブロック陸部の抵抗を低減してスムーズに水を分流や合流することができ、その結果、排水性が向上する。

【0027】尚、第2ブロック陸部8a,8bは、上記のように略凸レンズ断面状に形成すると、通常のブロックパ
20 ターンの場合の配設ピッチの2~3倍にわたって延在する長い陸部形状となり、1ピッチ当たりのブロック陸部

のエッジ成分量が減少することになり、これでは、十分な雪上性能を確保することができない。

【0028】そのため、この発明では、第2ブロック陸部8a,8bに、その長手方向を横切る細溝13を配設して、第2ブロック陸部8a,8bを複数個、好ましくは図1に示すように3個の分割陸部14a～14cに区分することによって、排水性能をさほど低下させることなく、1ピッチ当たりのブロック陸部のエッジ成分量を増加させることができ、この結果、雪上での制動及び駆動性能を確保することができる。

【0029】また、第2ブロック陸部8a, 8bを上記のように略凸レンズ断面状に形成すると、その両角部16a, 16bは鋭角に形成されることになり、この構成では、分割陸部14a, 14cの陸部剛性を十分に確保することができない。

【0030】そのため、この発明では、第2ブロック陸部8a, 8bの両側部16a, 16bに面取りを施すことによって、分割陸部14a, 14cの剛性を確保することができる。また、同様に、第1ブロック陸部6a, 6bの最もバターンセンター側に位置する角部15についても、同様に面取りを施すことによって、第1ブロック陸部6a, 6bの剛性を確保することができる。

【0031】さらに、この発明では、リブ状陸部5、第1ブロック陸部6a, 6b及び第2ブロック陸部8a, 8bのそれそれに、該陸部を横切る複数本のサイブ10を配設することとし、これによって、ブロック剛性を確保しつつ、エッジ成分を有効に増加させることができる結果、雪土性能が向上する。

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第2ブロック陸部の各陸部におけるサイドの配設角度を、いずれもタイヤ周方向に対して比較的大きな角度にすれば、特に駆動・制動性能時の操縦性能をより一層向上させることができる。

【0033】サイドの前記配設角度は、第2ブロック陸部8a,8bの場合には、図1に示すように、第2ブロック陸部8a,8bの長手方向と反対の向き（換言すれば、タイヤ周線を挟んで交差する向き）でかつタイヤ周方向4に対して90~140°の角度で配設することが好ましく、また、第1ブロック陸部6a,6bの場合あるいはリブ状陸部5の場合にも、タイヤ周方向4に対して90~140°の角度で配設することが好ましい。

【0034】尚、図1では、第1ブロック陸部6a,6bやリブ状陸部5へのサイド10の配設方向は、第2ブロック陸部8a,8bの場合と同様な角度で配設した場合を示してあるが、特に限定はしない。

【0035】以上のことから、この発明は、上記構成を有するトレッドパターンを採用することによって、初めて氷雪路面上での駆動・制動性能と濡れた路面上での排水性能の双方をバランスよく満足した空気入りタイヤの開発に成功したのである。

【0036】次に、他の実施形態について説明する。第2ブロック陸部8a,8bの両角部16a,16bや、第1ブロック陸部6a,6bの最もバーンセンター11側に位置する角部15に施す面取りは、陸部高さが漸減するようななだらかな曲面状にすれば、排水性能を向上させるのに有利に作用する。

【0037】さらに、この発明のタイヤは、タイヤ負荷転動時に、第2ブロック陸部8a,8bが、そのバーンセンター11側に位置する角部16aからトレッド端12a,12b側に位置する角部16bに向かって順次接地するような向きに車両に装着すれば、上述した効果が得られる。

【0038】さらによつて、第2ブロック陸部8a,8bは、その両角部16a,16bの先端18,19を結んだ直線mのタイヤ周方向4に対する角度が、鋭角側から測定して5~55°の範囲にあることが好ましい。前記角度が5°未満だと、第2ブロック陸部8a,8bの長さが通常のブロックパターンを有するタイヤの4ピッチ以上の長さになり、細溝13で分割陸部に区分しても、必要なエッジ成分量が得られなくなるおそれがあるからであり、また、前記角度が55°よりも大きくなると、第2ブロック陸部8a,8a又は8b,8b間に形成される傾斜溝21a,21bのタイヤ周方向4に対する配設角度が大きくなりすぎて、十分な排水性能が得られなくなる恐れがあるからである。尚、前記角度は、排水性能と雪上性能の双方をバランスよく満足させるには、10~50°の範囲にすることがより好適である。

【0039】加えて、第1ブロック陸部6a, 6bの最もバ

陸部8a, 8bの両角部16a, 16bは、その頂角θが20～50°の範囲にあることが好ましい。前記頂角が20°未満だと、ブロック陸部の剛性が不足する傾向があり、また、50°を超えると、トレッド接地域内の水の流線方向と傾斜溝21a, 21bの配設方向とが一致しなくなって排水能力が低下する傾向があるからである。尚、前記頂角は、より好適には25～45°とする。

【0040】また、第1ブロック陸部6a,6b、及び第2ブロック陸部8a,8bの分割陸部14a～14cに配設するサイ

10 プ10の本数はそれぞれ少なくとも2本にすることが雪上性能を確保する点で好ましく、より好ましくは3～6本とする。

【0041】さらに、パターンセンター11を挟んで向かい合う、一対の第1ブロック陸部6a1,6b1同士及び一対の第2ブロック陸部8a1,8b1同士を、いずれもタイヤ周方向4に所定の位相差で形成すれば、パターンノイズの低減を図ることができる。

【0042】さらにまた、図1に示すように、リブ状陸部5は、その両側壁から所定ピッチで交互に分岐する分岐部22を具え、該分岐部22は、第2ブロック陸部8a, 8bのパターンセンター11側に位置する角部16aと向かい合う鋭角の角部23を有し、該角部23に、その先端24に向かって陸部高さが減少する面取りを施せば、トレッド接地中央域の排水性能を高めるとともに、雪上性能に有効なエッジ成分を有效地に増加させることができる。

【0043】加えて、図2に示すように、リブ状陸部5は、タイヤ周方向4にストレート状に延びる1対の周方向溝25a, 25bによって区画形成され、該周方向溝25a, 25bは、第2ブロック陸部8a, 8bのパターンセンター11側に位置する角部16aと対応する溝壁位置に、タイヤ周方向4に隣接する2個の第2ブロック陸部8a, 8a又は8b, 8b間に位置する傾斜溝21a, 21bへの水の流入を促進する擬似陸部26を設ければ、排水性能をより一層向上させることができる。

【0044】尚、擬似陸部26は、傾斜溝21a, 21bへの水の流入を促進するための形状を有すればよいが、一例を挙げておくと、図2に示すような略三角形や略台形形状の平面又は断面形状にすることが好ましく、また、その陸部高さをリン状陸部5の側壁27a, 27bからトレッド端部23a, 23bに向かって漸減するように構成することが好ましい。

【0045】上述したところは、この発明の実施形態の一例を示したにすぎず、請求の範囲において種々の変更を加えることができる。

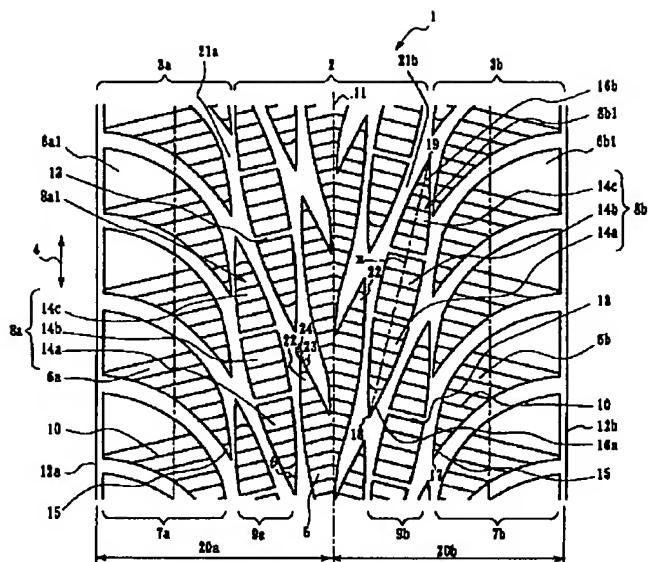
【0046】

【実施例】次に、この発明に従う空気入りタイヤを試作し、性能評価を行ったので、以下で説明する。

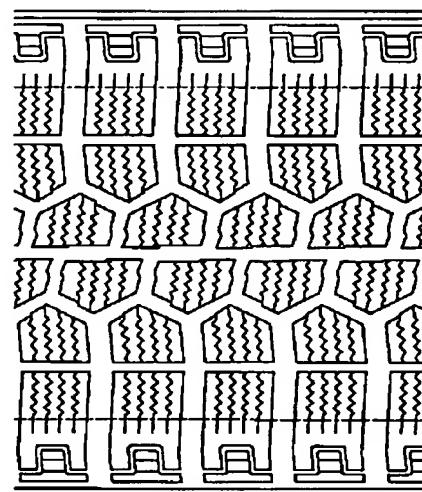
14a, 14b, 14c 分割陸部
 15, 16a, 16b 角部
 17, 18, 19 角部の先端
 20a, 20b トレッド半区域
 21a, 21b 傾斜溝
 22 分岐部

- 23 角部
- 24 角部の先端
- 25a, 25b 周方向溝
- 26 擬似陸部
- 27a, 27b リブ状陸部の側壁

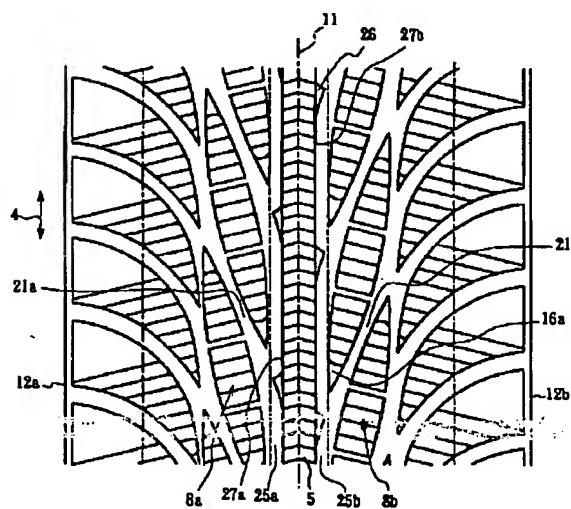
【图1】



〔図3〕



〔図2〕



Machine translation for Japan 2002-103919

* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention aims at improvement in the wastewater engine performance on the wet road surface, securing drive / braking engine performance on the snow-and-ice road surface of this tire more to a detail about a pneumatic tire, especially the pneumatic tire for winter.

[0002]

[Description of the Prior Art] For example, the conventional pneumatic tire for winter suitable for running a snow-and-ice road surface top and the so-called snow tire By arranging the zigzag slot and straight slot which extend along a hoop direction as shown in drawing 3, and the transverse groove which extends crosswise [tire] over these slots as the tread pattern While carrying out partition formation of the block land part of two or more polygons at the tread section The block land part located in the right-and-left tread half area when classifying the tread section into two tread half areas in the pattern pin center, large It is not what forms the so-called directivity pattern which shifted the block land part located in axial symmetry or a tire hoop direction by predetermined phase contrast across a pattern pin center, large in a right-and-left tread half area. It is common to be arranged as the so-called point symmetry pattern rotated 180 degrees so that the extension direction of the block land part located in one tread half area and the block land part located in the tread half area of another side might become in the direction which reversed the right reverse of a tire hoop direction.

[0003] Although it is effective in arrangement of a straight slot raising the wastewater engine performance on the wet road surface in the case of the tire which has the above-mentioned tread pattern, the improvement effectiveness of drive / braking engine performance on a snow-and-ice road surface is especially small, and although obtained, on the other hand, the effectiveness which controls the wastewater engine performance on the wet road surface, especially generating of hydroplaning is small [a transverse groove / drive / braking engine performance on a snow-and-ice road surface].

[0004] Moreover, although it is effective in arrangement of a zigzag slot raising drive / braking engine performance on a snow-and-ice road surface, there is a fault of being inferior to the wastewater engine performance.

[0005] Therefore, it was difficult to satisfy the both sides of drive / braking engine performance on a snow-and-ice road surface, and the wastewater engine performance on the wet road surface with sufficient balance to the pneumatic tire for winter which has the conventional tread red pattern.

[0006]

[Problem(s) to be Solved by the Invention] The purpose of this invention arranges in the central region of the tread section the rib-like land part continuously prolonged along a tire hoop direction, and the configuration of the block land part of the middle land part train located in the both sides of this rib-like land part and a side land part train is rationalized. While setting up so that a directivity pattern advantageous to the wastewater engine performance in the wet road surface may be formed It is in offering the pneumatic tire with which it was satisfied of the both sides of drive / braking engine performance on a snow-and-ice road surface, and the wastewater engine performance on the wet road surface with sufficient balance by arranging SAIPU which crosses each land part proper.

[0007]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, when this invention classifies the tread section into a central region and the method region of both sides, At least one rib-like land part which is located in said central region and is continuously prolonged along a tire hoop direction, The side land part train which consists of two or more 1st block land parts which were located in said side region and arranged in the tire hoop direction at the predetermined spacing, In the pneumatic tire which has the middle land part train which consists of two or more 2nd block land parts which were located between the rib-like land part and the side land part train, and were arranged in the tire hoop direction at the predetermined spacing in the tread section The 1st block land parts of a pair which face each other across a pattern pin center, large, and the 2nd block land parts of a pair The 2nd block land part from which all have [side / pattern pin center, large] the arrangement relation of the shape of reverse Ha's character toward tread one end, and constitute said middle land part train It consists of two or more division land parts classified by arrangement of the rill which has a rough convex lens cross-section-like tread configuration, and crosses the longitudinal direction by the front view of a tire. To the corner of the 1st block land part most located in a pattern pin center, large side, and both the corners of the 2nd block land part It is the pneumatic tire characterized by arranging two or more SAIPU which performs beveling with which land part height decreases toward each tip, and crosses this to each land part of a rib-like land part,

the 1st block land part, and the 2nd block land part.

[0008] Moreover, as for the 2nd block land part, it is [the above-mentioned tire] desirable at the time of load rolling of a tire to equip a car at the sense which carries out sequential touch-down toward the corner located in tread one end from the corner located in the pattern pin center,large side from the point of obtaining sufficient wastewater engine performance.

[0009] Furthermore, it is this better ** that the include angle to the tire hoop direction of the straight line m which connected the tip of both that corner measures the 2nd block land part from an acute-angle side in satisfying reservation of a block edge and the both sides of the improvement effectiveness in the wastewater engine performance with sufficient balance, and it is in the range of 5-55 degrees.

[0010] When the engine performance on the snow needs to be raised more, as for the 2nd block land part, constituting from three division land parts is desirable further again.

[0011] In addition, when raising wastewater nature advantageously, securing the rigidity of the 1st block land part, as for the corner of the 1st block land part most located in a pattern pin center,large side, and both the corners of the 2nd block land part, it is desirable that it is in the range the vertical angle of whose is 20-50 degrees.

[0012] Moreover, in order to make the engine performance on the snow increase effectively, without reducing block rigidity so much, as for the number of SAIPU arranged in the 1st block land part and the division land part of the 2nd block land part, it is desirable respectively that it is at least two.

[0013] In addition, when raising further the controllability ability at the time of drive / braking engine performance, it is more suitable for the arrangement include angle of SAIPU in each land part of a rib-like land part, the 1st block land part, and the 2nd block land part that each is a comparatively big include angle to a tire hoop direction.

[0014] Furthermore, when reduction of a pattern noise needs to be aimed at, as for each of 1st block land parts of a pair which face each other across a pattern pin center,large, and 2nd block land parts of a pair, it is desirable to come to form in a tire hoop direction by predetermined phase contrast.

[0015] While raising the wastewater engine performance of a tread touch-down central region, further again as a means to which an edge component effective in the engine performance on the snow is made to increase effectively A rib-like land part is equipped with the tee which branches by turns in a predetermined pitch from the both-sides wall, and, as for this tee, it is desirable to perform beveling with which it has the corner of the acute angle which faces the corner located in the pattern pin center,large side of the 2nd block land part, and land part height decreases toward the tip to this corner.

[0016] In addition, when thinking especially the wastewater engine performance as important, partition formation of the rib-like land part is carried out by one pair of hoop direction slots which extend in the shape of a straight in a tire hoop direction, and as for this hoop direction slot, it is desirable to prepare the false land part which promotes the inflow of the water to the inclination slot located between the two 2nd block land parts which adjoin the corner located in the pattern pin center,large side of the 2nd block land part and a corresponding groove face location in a tire hoop direction.

[0017]

[Embodiment of the Invention] Drawing 1 shows some tread patterns formed in the typical tread section of a pneumatic tire according to this invention.

[0018] When the tire which has the tread section 1 shown in drawing 1 classifies the tread section 1 into the central region 2 and the method regions 3a and 3b of both sides, At least one rib-like land part 5 which is located in said central region 2 and is continuously prolonged along the tire hoop direction 4, The side land part trains 7a and 7b which consist of two or more 1st block land parts 6a and 6b which were located in said side regions 3a and 3b, and were arranged in the tire hoop direction 4 at the predetermined spacing, It has the middle land part trains 9a and 9b which consist of two or more 2nd block land parts 8a and 8b which were located between the rib-like land part 5 and the side land part trains 7a and 7b, and were arranged in the tire hoop direction 4 at the predetermined spacing.

[0019] And while the main descriptions on the configuration of this invention arrange the rib-like land part 5 in the central region 2 of the tread section 1 Each block land part 8a and 8b of the middle land part trains 9a and 9b located in the both sides of the rib-like land part 5 and the side land part trains 7a and 7b and the configuration of 6a and 6b are rationalized. It is in arranging SAIPU 10 which forms a directivity pattern advantageous to the wastewater engine performance in the wet road surface, in addition crosses each land parts 5, 6a, 6b, 8a, and 8b proper.

[0020] At least one rib-like land part 5 continuously prolonged along a tire hoop direction is more specifically arranged in said central region 2. The 1st block land part six a1 of a pair which faces each other across the pattern pin center,large 11, six b1 comrades and the 2nd block land part eight a1 of a pair, and eight b1 comrades All are arranged in the shape of [of reverse Ha] a character toward a tread edge 12a side and the 12b side from the pattern pin center,large 11 side. The 2nd block land parts 8a and 8b it consists of two or more division land parts 14a-14c classified by arrangement of the rill 13 which has a rough convex lens cross-section-like tread configuration, and crosses the longitudinal direction by the front view of a tire. To the corner 15 of the 1st block land parts 6a and 6b most located in the pattern pin center,large 11 side, and both the corners 16a and 16b of the 2nd block land part Beveling with which land part height decreases toward each tip 17, 18, and 19 is performed. By being in arranging two or more SAIPU 10 which crosses this, and adopting the above-mentioned configuration as each land part of the rib-like land part 5, the 1st block land parts 6a and 6b, and the 2nd block land parts 8a and 8b The both sides of drive / braking engine performance on a snow-and-ice road surface and the wastewater engine performance on the wet road surface can be satisfied with sufficient balance.

[0021] In addition, in drawing 1, although the pattern pin center,large 11 shows the case of being in agreement with a tire

equatorial location, the pattern pin center, large 11 may shift it from a tire equatorial location a little.

[0022] Hereafter, the circumstances of having come to complete this invention are explained with an operation. In order for an artificer to satisfy the both sides of drive / braking engine performance on a snow-and-ice road surface, and the wastewater engine performance on the wet road surface with sufficient balance, A tread pattern Not the conventional point symmetry pattern but the advantageous directivity pattern in respect of the wastewater engine performance, Namely, the 1st block land part six a1 of a pair which faces each other across the pattern pin center, large 11, six b1 comrades and the 2nd block land part eight a1 of a pair, and eight b1 comrades We decided to adopt the directivity pattern which has arranged all in the shape of [of reverse Ha] a character toward the tread edge 12a12b side from the pattern pin center, large 11 side.

[0023] And an artificer can secure the grip force when the crawler bearing area of the land part located in the central region 2 of the tread section 1 increasing, and running the dry road surface and a low friction road surface like a snow-and-ice road surface, if at least one rib-like land part 5 which is located in said central region 2 and is first prolonged continuously along the tire hoop direction 4 is arranged.

[0024] Moreover, although the wastewater capacity to the tire side is made to decline, the water which exists in one tread half area 20a or 20b moving to tread half area 20b or 20a of another side, and forming the abouchement within tread touch-down, in case the water which exists in a tread touch-down region is discharged Since the water which exists in a tread touch-down region by arranging the rib-like land part 5 in the central region 2 in this invention can be substantially divided to the tread half areas 20a and 20b on either side, Splitting of the water which can prevent the abouchement of water which was mentioned above and exists in a tread touch-down central region can be carried out smoothly, consequently the wastewater engine performance increases.

[0025] Furthermore, the fundamental engine performance on the snow is securable by establishing the middle land part trains 9a and 9b which become the both sides of the rib-like land part 5 from two or more 2nd block land parts 8a and 8b, respectively, and the side land part trains 7a and 7b which consist of two or more 1st block land parts 6a and 6b, and considering as the block keynote.

[0026] If the tread configuration of the 2nd block land parts 8a and 8b is told to the shape of a rough convex lens cross section, and a twist concrete target as shown in drawing 1, further again By making a part of two radii into a streamlined configuration like the profile configuration of a field where it overlapped when lapping, the resistance of a block land part to a stream is reduced, and splitting and joining can do water smoothly, consequently wastewater nature improves.

[0027] In addition, if the 2nd block land parts 8a and 8b are formed in the shape of a rough convex lens cross section as mentioned above, it becomes the long land part configuration which extends over two to 3 times of the arrangement pitch in the case of the usual block pattern, the amount of edge components of the block land part per one pitch will decrease, and, now, they cannot secure sufficient engine performance on the snow.

[0028] Therefore, in this invention, the rill 13 which crosses that longitudinal direction to the 2nd block land parts 8a and 8b is arranged. The 2nd block land parts 8a and 8b by classifying more than one into three division land parts 14a-14c, as preferably shown in drawing 1 Without reducing the wastewater engine performance so much, the amount of edge components of the block land part per one pitch can be made to increase, consequently braking in a place on the snow and the drive engine performance can be secured.

[0029] Moreover, if the 2nd block land parts 8a and 8b are formed in the shape of a rough convex lens cross section as mentioned above, both those corners 16a and 16b will be formed in an acute angle, and cannot fully secure the land part rigidity of the division land parts 14a and 14c with this configuration.

[0030] Therefore, in this invention, the rigidity of the division land parts 14a and 14c is securable by beveling to both the corners 16a and 16b of the 2nd block land parts 8a and 8b. Moreover, the rigidity of the 1st block land parts 6a and 6b is securable by beveling similarly similarly about the corner 15 of the 1st block land parts 6a and 6b most located in a pattern pin center, large side.

[0031] Furthermore, in this invention, as a result of being able to make an edge component increase effectively, supposing that two or more SAIPU 10 which crosses this land part is arranged, and securing block rigidity to each of the rib-like land part 5, the 1st block land parts 6a and 6b, and the 2nd block land parts 8a and 8b by this, the engine performance on the snow improves.

[0032] In addition, if each makes the arrangement include angle of SAIPU in each land part of a rib-like land part, the 1st block land part, and the 2nd block land part a comparatively big include angle to a tire hoop direction, the controllability ability at the time of drive / braking engine performance can be raised especially further.

[0033] Said arrangement include angle of SAIPU in the case of the 2nd block land parts 8a and 8b As shown in drawing 1, it is the sense (if it puts in another way) opposite to the longitudinal direction of the 2nd block land parts 8a and 8b. Are the sense which crosses on both sides of the tire circumference, and it is desirable to arrange at the include angle of 90-140 degrees to the tire hoop direction 4. Moreover, it is desirable to arrange at the include angle of 90-140 degrees to the tire hoop direction 4 also the case of the 1st block land parts 6a and 6b or in the case of the rib-like land part 5.

[0034] In addition, especially limitation is not carried out although drawing 1 has shown the case where the arrangement direction of SAIPU 10 to the 1st block land parts 6a and 6b or the rib-like land part 5 is arranged at the same include angle as the case of the 2nd block land parts 8a and 8b.

[0035] From the above thing, this invention succeeded in development of the pneumatic tire with which it was satisfied of the both sides of drive / braking engine performance on a snow-and-ice road surface, and the wastewater engine performance on the wet road surface with sufficient balance for the first time by adopting the tread pattern which has the above-mentioned configuration.

[0036] Next, other operation gestalten are explained. Beveling performed to both the corners 16a and 16b of the 2nd block land parts 8a and 8b and the corner 15 of the 1st block land parts 6a and 6b most located in the pattern pin center, large 11 side will act in favor of raising the wastewater engine performance, if it is made into the shape of a gently-sloping curved surface which land part height dwindles.

[0037] Furthermore, if sense in which the 2nd block land parts 8a and 8b carry out sequential touch-down toward tread edge 12a and corner 16b located in the 12b side from corner 16a located in that pattern pin center, large 11 side at the time of tire load rolling is equipped with the tire of this invention at a car, the effectiveness mentioned above will be acquired.

[0038] As for the 2nd block land parts 8a and 8b, it is desirable that the include angle to the tire hoop direction 4 of the straight line m which connected the tips 18 and 19 of both the corners 16a and 16b measures from an acute-angle side, and is in the range of 5-55 degrees further again. If said include angle is less than 5 degrees, even if the die length of the 2nd block land parts 8a and 8b will turn into die length of four or more pitches of the tire which has the usual block pattern and it will classify into a division land part by the rill 13. If it is because there is a possibility that the required amount of edge components may no longer be obtained and said include angle becomes larger than 55 degrees It is because there is a possibility that the arrangement include angle to the tire hoop direction 4 of the inclination slots 21a and 21b formed between the 2nd block land parts 8a and 8b, and 8b may become large too much, and sufficient wastewater engine performance may no longer be obtained. In addition, in order to satisfy the both sides of the wastewater engine performance and the engine performance on the snow with sufficient balance, it is more suitable for said include angle to make it the range of 10-50 degrees. Moreover, as for the arrangement include angle of a rill 13, it is desirable to make it the range of 90-140 degrees to a tire hoop direction.

[0039] In addition; as for the corner 15 of the 1st block land parts 6a and 6b most located in the pattern pin center, large 11 side, and both the corners 16a and 16b of the 2nd block land parts 8a and 8b, it is desirable that it is in the range the vertical angle theta of whose is 20-50 degrees. It is because there is an inclination for the direction of an elementary stream of the water of the area within tread touch-down and the arrangement direction of the inclination slots 21a and 21b to stop being in agreement, and for wastewater capacity to decline when there is an inclination for the rigidity of a block land part to run short if said vertical angle is less than 20 degrees and it exceeds 50 degrees. In addition, said vertical angle is more suitably made into 25-45 degrees.

[0040] Moreover, as for the number of SAIPU 10 arranged in the 1st block land parts 6a and 6b and the division land parts 14a-14c of the 2nd block land parts 8a and 8b, carrying out to at least two is desirable respectively at the point of securing the engine performance on the snow, and it makes it 3-6 more preferably.

[0041] Furthermore, if each of the 1st block land part six a1 of a pair which faces each other across the pattern pin center, large 11, six b1 comrades and 2nd block land parts eight a1 of a pair, and eight b1 comrades is formed in the tire hoop direction 4 by predetermined phase contrast, reduction of a pattern noise can be aimed at.

[0042] As shown in drawing 1, further again the rib-like land part 5 It has the tee 22 which branches by turns in a predetermined pitch from the both-sides wall. This tee 22 If beveling with which it has the corner 23 of the acute angle which faces corner 16a located in the pattern pin center, large 11 side of the 2nd block land parts 8a and 8b, and land part height decreases toward the tip 24 to this corner 23 is performed While raising the wastewater engine performance of a tread touch-down central region, an edge component effective in the engine performance on the snow can be made to increase effectively.

[0043] As shown in drawing 2, in addition, the rib-like land part 5 Partition formation is carried out by one pair of hoop direction slots 25a and 25b which extend in the shape of a straight in the tire hoop direction 4. These hoop direction slots 25a and 25b In corner 16a located in the pattern pin center, large 11 side of the 2nd block land parts 8a and 8b, and a corresponding groove face location If the false land part 26 which promotes the inflow of the water to the inclination slots 21a and 21b located between the two 2nd block land parts 8a and 8a which adjoin the tire hoop direction 4 or 8b, and 8b is formed, the wastewater engine performance can be raised further.

[0044] In addition, although it should just have a configuration for promoting the inflow of the water to the inclination slots 21a and 21b, when an example is given, as for the false land part 26, it is desirable to make it the flat surface of an abbreviation triangle or an abbreviation trapezoid configuration or a curved-surface configuration as shown in drawing 2, and it is desirable the land part] to constitute so that the land part height may be dwindled toward the tread edges 12a and 12b from the side attachment walls 27a and 27b of the rib-like land part 5.

[0045] The place mentioned above cannot be passed for an example of the operation gestalt of this invention to have been shown, but various modification can be added in a claim.

[0046]

[Example] Next, since the pneumatic tire according to this invention was made as an experiment and the performance evaluation was performed, it explains below.

- The tire of example 1 example 1 has the tread pattern shown in drawing 1. Tire sizes are 195 / 65R15, and the rate of a negative is made into 38%. The vertical angle theta of 15 degrees and both the corners 16a and 16b is made into 30 degrees for whenever [to the tire hoop direction 4 of the 2nd block land parts 8a and 8b / tilt-angle]. The arrangement number of SAIPU 10 By the 1st block land parts 6a and 6b, respectively by the division land parts 14a, 14b, and 14c of 7 and the 2nd block land parts 8a and 8b Four It is 3 and 4 and two or more SAIPU 10 is arranged by arrangement pitch 5.8mm to the rib-like land part 5. The arrangement include angle of SAIPU 10 Which land part was arranged to the tire hoop direction 4 in each tread half areas 20a and 20b classified in the pattern pin center, large 11 with the fixed include angle of 105 degrees, and constant width (0.5mm). Setting the beveling die length of each corners 15, 16a, 16b, and 23 to 6, 12, and 12 or 6mm, respectively, the tee 22 was arranged by whenever [tilt-angle / of 15 degrees] to the tire hoop direction 4, and formed the die-length by 26mm. In-addition,

about tire structures other than the tread section, it is considered as the almost same configuration as the thing of the usual pneumatic tire for passenger cars.

[0047] - The tire of example 2 example 2 has the tread pattern shown in drawing 2. The rate of a negative is made into 38%, and the vertical angle theta of 15 degrees and both the corners 16a and 16b is made into 30 degrees for whenever [to the tire hoop direction 4 of the 2nd block land parts 8a and 8b / tilt-angle]. The arrangement number of SAIPU 10 By the 1st block land parts 6a and 6b, respectively by the division land parts 14a, 14b, and 14c of 7 and the 2nd block land parts 8a and 8b Four It is 3 and 4 and SAIPU 10 is arranged by arrangement pitch 5.8mm to the rib-like land part 5. The arrangement include angle of SAIPU 10 Which land part was arranged to the tire hoop direction 4 in each tread half areas 20a and 20b classified in the pattern pin center, large 11 with the fixed include angle of 105 degrees, and constant width (0.5mm). The beveling die length of each corners 15, 16a, and 16b was set to 6 and 12 or 12mm, respectively, and the dimension of a false land part set hoop direction die length to 17mm, and it set width of face to 4.5mm.

[0048] - The tire of the conventional example conventional example has the tread pattern shown in drawing 3.

[0049] (Performance evaluation) Since the snow-and-ice engine performance and the wastewater engine performance were evaluated, each above-mentioned sample offering tire is explained below. Each above-mentioned sample offering tire was attached to the standard rim (6JJ), and each following trial was performed under the conditions of tire internal pressure:230kPa and tire load load:real vehicle binary-name entrainment.

[0050] Three kinds of engine performance of the total engine performance in a place on the snow, brake performance on the snow, and the on-the-snow traction engine performance estimated the snow-and-ice engine performance. The total engine performance in a place on the snow evaluated synthetically the braking engine performance, the start engine performance, the rectilinear-propagation engine performance, and the cornering engine performance with the feeling by a pro's driver in the test course of a hardened snow road surface. Brake performance on the snow measured the brake stopping distance when slamming the brake (full braking) for a hardened snow road surface top from 40 km/h, and evaluated it from this measured value. The on-the-snow traction engine performance measured the acceleration time until it departs and arrives at 50m location on a hardened snow road surface, and evaluated it from this measured value. The wastewater engine performance measured critical speed in case hydroplaning when carrying out rectilinear-propagation transit of the wet with a depth of 5mm road surface top, and passing occurs, and evaluated it by this.

[0051] These evaluation results are shown in Table 1. In addition, the numeric value in Table 1 expresses the conventional example with the characteristic ratio set to 100, and shows that it is excellent, so that which engine performance is large.

[0052]

[Table 1]

		従来例	実施例 1	実施例 2
性	雪上トータル性能	1 0 0	1 0 5	1 0 2
能	雪上ブレーキ性能	1 0 0	1 0 5	1 0 3
評	雪上駆動性能	1 0 0	1 0 5	1 0 2
価	排水性能	1 0 0	1 2 5	1 3 0

[0053] the evaluation result of Table 1 to the examples 1 and 2 -- the conventional example -- comparing -- both the wastewater engine performance and the engine performance on the snow -- although -- it excels.

[0054]

[Effect of the Invention] Offer of the pneumatic tire which was excellent in the both sides of drive / braking engine performance on a snow-and-ice road surface and the wastewater engine performance on the wet road surface with this invention was attained.

[Translation done.]

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] At least one rib-like land part which is located in said central region and is continuously prolonged along a tire hoop direction when classifying the tread section into a central region and the method region of both sides, The side land part train which consists of two or more 1st block land parts which were located in said side region and arranged in the tire hoop direction at the predetermined spacing, In the pneumatic tire which has the middle land part train which consists of two or more 2nd block land parts which were located between the rib-like land part and the side land part train, and were arranged in the tire hoop direction at the predetermined spacing in the tread section The 1st block land parts of a pair which face each other across a pattern pin center,large, and the 2nd block land parts of a pair The 2nd block land part from which all have [side / pattern pin center,large] the arrangement relation of the shape of reverse Ha's character toward tread one end, and constitute said middle land part train It consists of two or more division land parts classified by arrangement of the rill which has a rough convex lens cross-section-like tread configuration, and crosses the longitudinal direction by the front view of a tire. To the corner of the 1st block land part most located in a pattern pin center,large side, and both the corners of the 2nd block land part The pneumatic tire characterized by arranging two or more SAIPU which performs beveling with which land part height decreases toward each tip, and crosses this to each land part of a rib-like land part, the 1st block land part, and the 2nd block land part.

[Claim 2] It is the pneumatic tire which indicated the 2nd block land part at claim 1 which carries out sequential touch-down toward the corner located in tread one end from the corner located in the pattern pin center,large side at the time of load rolling of a tire.

[Claim 3] The 2nd block land part is the pneumatic tire indicated to claim 1 which the include angle to the tire hoop direction of the straight line (m) which connected the tip of both the corner measures from an acute-angle side, and has it in the range of 5-55 degrees, or 2.

[Claim 4] The 2nd block land part is the pneumatic tire indicated to claims 1 and 2 constituted from three division land parts, or 3.

[Claim 5] The corner of the 1st block land part most located in a pattern pin center,large side and both the corners of the 2nd block land part are the pneumatic tire indicated in any 1 term of claims 1-4 in the range the vertical angle of whose is 20-50 degrees.

[Claim 6] The number of SAIPU arranged in the 1st block land part and the division land part of the 2nd block land part is the pneumatic tire indicated in any 1 term of claims 1-5 whose number is at least two, respectively.

[Claim 7] The arrangement include angle of SAIPU in each land part of a rib-like land part, the 1st block land part, and the 2nd block land part is the pneumatic tire indicated in any 1 term of claims 1-6 which each makes a comparatively big include angle to a tire hoop direction.

[Claim 8] Each of 1st block land parts of a pair which face each other across a pattern pin center,large, and 2nd block land parts of a pair is the pneumatic tire indicated in any 1 term of claims 1-7 which it comes to form in a tire hoop direction by predetermined phase contrast.

[Claim 9] It is the pneumatic tire indicated in any 1 term of claims 1-8 which perform beveling with which a rib-like land part is equipped with the tee which branches by turns in a predetermined pitch from the both-sides wall, this tee has the corner of the acute angle which faces the corner located in the pattern pin center,large side of the 2nd block land part, and land part height decreases toward the tip to this corner.

[Claim 10] It is the pneumatic tire which partition formation of the rib-like land part was carried out by one pair of hoop direction slots which extend in the shape of a straight in a tire hoop direction, and indicated this hoop direction slot in any 1 term of claims 1-8 which prepare the false land part which promotes the inflow of the water to the inclination slot located between the two 2nd block land parts which adjoin a tire hoop direction in the corner located in the pattern pin center,large side of the 2nd block land part, and a corresponding groove face location.

[Translation done.]
